

Claims (EP)

1. A method of transmitting (2000) a data packet on a communication path from a first communication node to a 5 second communication node in a mobile network, the method characterised by the steps of:

receiving a route message from said second communication node, wherein said route message includes a list of a plurality of intermediary addresses between 10 said first communication node and said second communication node, the plurality of intermediary addresses comprising an address of a mobile router;

generating (3014, 3038) a preferred communication path in response to said list of intermediary addresses; 15 and

transmitting (2050) said at least one data packet from said first communication node to said second communication node via said preferred communication path.

20 2. The method of transmitting a data packet according to Claim 1, wherein said data communication network supports nested network mobility operation and said step of transmitting includes the step of:

routing said at least one data packet via a 25 plurality of mobile routers identified by said intermediary addresses in said nested mobility network.

30 3. The method of transmitting a data packet according to Claim 1 or Claim 2, wherein said data communication network operates in accordance with an IPv6 and/or IPv4 specification.

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4. The method of transmitting a data packet according to any preceding Claim, wherein said first communication node is a correspondent node of the said second communication node and/or said second communication node
5 is a mobile network node.

5. The method of transmitting a data packet according to any preceding Claim, the method further characterised by the step of:

10 sending an advertising message, by a plurality of communication nodes in the mobile network, that includes route information related to communication nodes attached to said second communication node, so that a communication path to an intended recipient can be
15 determined.

6. The method of transmitting a data packet according to any preceding Claim, wherein said list of the plurality of intermediary addresses includes addresses of
20 one or more mobile routers above the second communication node in a route hierarchy for delivering said data packet to an intended recipient.

7. The method of transmitting a data packet according to Claim 5 or Claim 6, the method further characterised by the step of:

requesting transmission of one or more advertisement messages, containing route information of one or more IP addresses, from adjacent communication
30 nodes when said second communication node moves to a new location within the mobile network.

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8. The method of transmitting a data packet according to any of preceding Claims 5 or 7, the method further characterised by the steps of:

5 extracting intermediary route messages from said route information in said advertising message at a communication node; and

transmitting said intermediary route messages to communication nodes that the extracting communication node serves.

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9. The method of transmitting a data packet according to Claim 8, the method further characterised by the step of:

15 appending a route message of the communication unit to said list of intermediary routes in said advertising message at said communication node.

10. The method of transmitting a data packet according to any of preceding Claims 5 or 7 to 9 further characterised by the step of:

sending periodically said route advertising message to all or a selected number of communication nodes in the mobile network.

25 11. The method of transmitting a data packet according to any of preceding Claims 5 or 7 to 10, the method further characterised by the step of:

30 sending a mobile network prefix advertisement message by a mobile router at a top of a routing hierarchy in the mobile network to advertise said mobile network prefix; and

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determining by communication nodes in the same mobile network that they are located within the sending mobile router's mobile network.

5 12. The method of transmitting a data packet according to any of preceding Claims, the method further characterised by the step of:

sending an extended binding update message containing route information only to communication nodes
10 outside of the sending communication node's mobile network.

13. A communication message (2600, 2700) having route information that includes an ordered list of a plurality
15 of intermediary addresses comprising at least one address of a mobile router between a first communication node and a second communication node, for use in the method of any of preceding Claims 1 to 12.

20 14. A communication message (2500) that includes a plurality of intermediary routes or intermediary source routes corresponding to a respective plurality of mobile routers to be used to forward said data packet to said intended recipient.

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15. The communication message according to Claim 14, wherein said message is a mobile network prefix advertisement message (2300).

30 16. A communication message including a request (2200, 2400) for a communication message according to Claim 14 or Claim 15.

17. A communication node comprising:
an interface for communicating with other
communication nodes, for example in a mobile network;

5 the communication node characterised by:
a memory element storing an extended binding cache
containing routes and/or source route information
relating to a plurality of communication nodes, for
example nodes in the mobile network;

10 a processor, operably coupled to said memory
element, for generating a route, based on information
stored in the extended binding cache; and
a transmitter, operably coupled to said processor,
for delivering a data packet to an intended recipient via
15 said route.

18. A communication node comprising:
an interface for communicating with other
communication nodes, for example in a mobile network;

20 the communication node characterised by:
a receiver operably coupled to said interface,
receiving an extended binding update message containing
route information relating to a communication node in the
mobile network; and

25 a processor, operably coupled to said receiver,
for generating a care of source route message, based on
information contained in the extended binding update
message, the care of source route message comprising an
intermediary address of a mobile router.

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19. A storage medium (2800) storing care of source route information, in accordance with any of the preceding Claims.

5 20. A method for building an extended binding cache at a first communication node, the method characterised by the steps of:

receiving, from a second communication node, an extended binding update message indicating a plurality of
10 intermediary addresses in a route for messages to reach said second communication node, the plurality of intermediary addresses comprising an address of a mobile router;

15 comparing said intermediary addresses of said extended binding update message with intermediary addresses of the first communication node's route messages;

20 extracting at least one subsequent route message of said second communication node, when said comparison fails to yield a match following previous route matches, thereby generating an extended binding cache entry indicating an improved route to said second communication node.

25 21. A method for constructing and sending (700, 800, 900) a care-of route advertising message at a mobile network node, the method characterised by the steps of:

30 building (750, 850, 950) a care-of route advertisement message including a Care-of Route of said mobile network node; and

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sending (760, 860, 960) the care-of route advertisement message to all nodes operably coupled to mobile network node;
wherein said steps of building and sending are initiated
5 by one of the following:

receiving (720) an advertisement message according to Claim 14 or Claim 15; or
receiving (920) a request for an advertisement message according to Claim 16; or
10 responding (820) to a time-out of an advertising message time.

22. A method (1700, 1800, 1900) for constructing and sending mobile network prefix advertising message at a
15 mobile router, the method characterised by the steps of:

building (1725, 1815, 1920) a mobile network prefix advertising message including a mobile network prefix and a mobile network prefix length; and

20 sending (1730, 1820, 1925) the mobile network prefix advertising message to all nodes operably coupled to said mobile router;
wherein said steps of building and sending are initiated by one of the following:

25 receiving (1710) an mobile network prefix advertising message according to Claim 15; or
receiving (1910) a request for an mobile network prefix advertising message according to Claim 16; or
responding (1810) to a time-out of a mobile network prefix advertising message time.

30 23. A storage medium (665) storing processor-implementable instructions for controlling a processor to

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carry out the method of any of claims 1 to 12, 20, 21 or 22.

24. Apparatus adapted to perform the method of any of 5 any of claims 1 to 12 or 16.

25. A communication unit comprising apparatus according to Claim 24.

10 26. A communication system comprising a communication unit according to Claim 25 or apparatus according to Claim 26.